

Claims

1. A process for the production of a molecular sieve adsorbent blend product with improved performance characteristics comprising

5 preparing a zeolite product;

preparing an attapulgite binder comprising highly dispersed attapulgite fibers;

mixing the zeolite with the attapulgite binder and water to produce a mixture;

forming a molecular sieve adsorbent product from the mixture; and

calcining the adsorbent product to form the molecular sieve adsorbent blend product,

wherein the tapped bulk density of the highly dispersed attapulgite fibers, as measured according DIN/ISO 787, is more than about 550 g/l.

2. The process of Claim 1 wherein the water adsorption capacity of the highly dispersed attapulgite fibers is greater than about 35 percent.

20 3. The process of Claim 1 wherein the attapulgite binder comprises from about 5 to about 30 percent, by weight, of the molecular sieve adsorbent blend product.

4. The process of Claim 1 wherein the attapulgite binder comprises from about 5 to about 20 percent by weight 25 of the molecular sieve adsorbent blend product.

5. The process of Claim 1 further comprising blending a pore forming agent with the highly dispersed attapulgite binder and zeolite powder.

6. The process of Claim 5 wherein the pore forming agent comprises from about 2 to about 15 percent, by weight, of the molecular sieve adsorbent blend product.

7. A molecular sieve adsorbent blend product formed by the process of Claim 1.

8. A molecular sieve adsorbent blend product comprising a zeolite blended with a highly dispersed attapulgite binder, wherein the tapped bulk density of the highly dispersed attapulgite binder is more than about 550 g/l.

9. The product of Claim 8 wherein the water adsorption capacity of the highly dispersed attapulgite fibers is more than about 35 percent.

10. The product of Claim 8 wherein the highly dispersed attapulgite binder comprises from about 5 to about 30 percent by weight of the molecular sieve adsorbent blend product.

11. The product of Claim 8 wherein the highly dispersed attapulgite binder comprises from about 5 to about 20 percent by weight of the molecular sieve adsorbent blend product.

25 12. The product of Claim 8 further comprising a pore

forming agent.

13. A process for separation of components of a gaseous or a liquid feed stream comprising
5 passing the components of the gaseous or liquid feed stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

14. A process for drying a gaseous feed stream comprising passing the feed stream over the molecular sieve adsorbent blend product of Claim 8.

10 15. A process for adsorption of carbon dioxide from an air stream comprising

passing the air stream over the molecular sieve adsorbent blend product produced by the process of Claim 1.

16. A process for removal of water from a gaseous or liquid ethanol stream comprising passing the gaseous or liquid ethanol stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

20 17. A process for separation of nitrogen and oxygen from an air stream comprising passing the air stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

25 18. A process for removal of sulfur and oxygen containing compounds from a hydrocarbon stream comprising passing the hydrocarbon stream over the molecular sieve adsorbent blend product by the process of Claim 1.

19. A process for removal of carbon monoxide, carbon dioxide and nitrogen from a hydrogen gas stream comprising passing the hydrogen gas stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

5 20. A process for removal of water from a gaseous or liquid hydrocarbon stream comprising passing the gaseous or liquid hydrocarbon stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

10 21. A process to separate n-paraffins from a mixture of iso-paraffins and n-paraffins comprising passing the mixture over the molecular sieve adsorbent blend produced by the process of Claim 1.

15 22. A process for removal of water from a gaseous or liquid stream of refrigerants comprising passing the gaseous or liquid stream over the molecular sieve adsorbent blend produced by the process of Claim 1.

23. A process for removal of water and carbon dioxide from air comprising passing the air over the molecular sieve adsorbent blend produced by the process of Claim 1.

20 24. A process for catalytic conversion of organic compounds comprising passing the organic compounds over the molecular sieve adsorbent blend produced by the process of Claim 1.